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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/418,441	10/15/1999	HARUHITO NAKAMURA	Q56262	8901

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EXAMINER

WERNER, BRIAN P

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/418,441

Applicant(s)

NAKAMURA ET AL.

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-19, 21, 23-29, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14, 15, 18 and 19 is/are allowed.
- 6) ☒ Claim(s) 21, 23, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 16, 17 and 24-29 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The following Office Action is responsive to the claim amendment and remarks received on January 5, 2005. Claims 14-19, 21 and 23-29, 33 and 34 are now pending; of which claims 16, 17, and 24-29 are withdrawn as non-elected.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21, 23, 33 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Yahav et al. (US 6,057,909 A).

Repeated From Previous Office Action:

Regarding claim 33, which is representative of claim 34, Yahav discloses:

sequential illumination of an object (e.g., figure 4, numeral 72) with first and second illumination light, both having a linearly varying intensity (figure 6A, “modulation of illumination”; the leading and trailing edges of the illumination are linearly varying);

acquiring an image of the object by acquisition with a gain having a faster changing rate than the changing rate of the illumination (figure 6A, “modulation of reflected radiation”; not only is the rate of change of the leading and trailing edges faster than the illumination as seen,

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but the duration of the change of off-to-on is faster thus the reference meets this limitation is two ways) where the image is acquired plural times (“repeated multiple times in sequence during a single field or frame” at column 15, line 27); and

detecting a distance between individual points of the object (“three-dimensional image of the scene” at column 2, line 2; see figure 6B, “D1” and “D2” which represent distances between points) in real time within a frame of the video (“depth information substantially simultaneously from all pixels in a scene” at column 1, line 63; “frame period” at column 15, line 26).

Regarding claims 21 and 23, the first illumination increase with time and the second decreases with time (figure 6A, “modulation of illumination”; the leading edge increases with time and the trailing edge decreases with time, and both are linearly varying).

Response to Arguments

Applicant’s arguments have been fully considered but are not persuasive. On response page 11, the applicant characterizes the Yahav reference as follows :

- “... while Yahav may disclose a linearly varying intensity of light, it does not disclose illuminating an object sequentially with a first illumination light and a second illumination light, both having a linearly varying intensity.”
- “Yahav discloses only one illumination light 40 that illuminates the object 28.”
- “While two modulations are shown, they refer to the modulation of illumination and the modulation of reflection. For example, Fig. 6A of Yahav shows two graphs. However, only the top graph depicts modulation of illumination. On the other hand the bottom graph depicts modulation of reflection.”

First, it is noted that claim 33 (and equivalently in claim 34) requires, “illuminating the object sequentially with a first illumination light and a second illumination light, both illumination lights having a linearly varying intensity”. While the claim requires first and second illumination light, the claim DOES NOT require first and second light sources. There is nothing in the claim that precludes the first and second illumination light from emanating from the exact same light source; albeit at a later period of time. Thus, Yahav meets the claim requirement as follows:

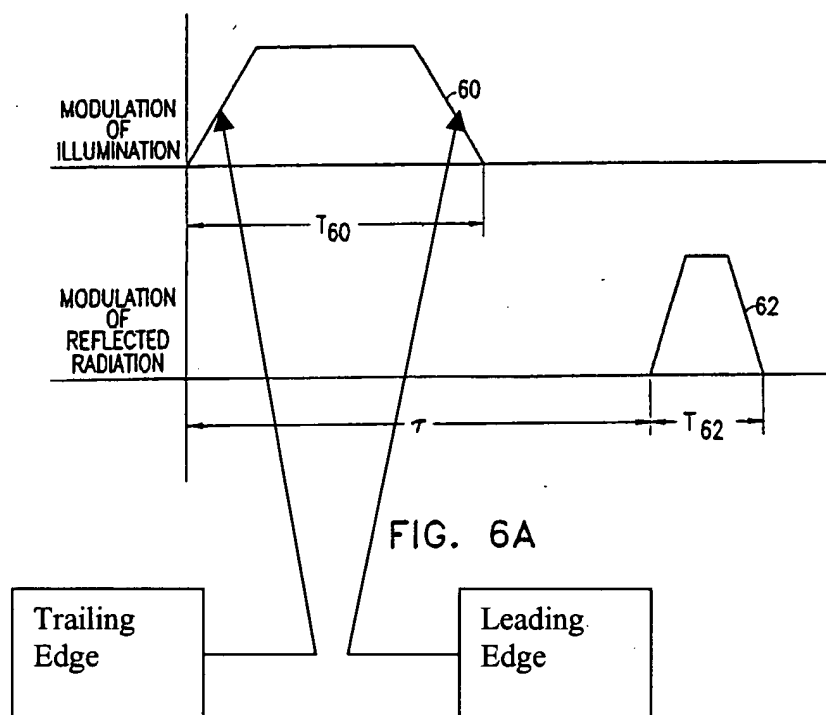
The object, e.g., at figure 1, numeral 26, is illuminated by source 40. The waveform of the illumination signal is depicted at figure 6A, at numeral 60. The waveform is NOT square. Rather, it has a leading edge and a trailing edge, both of which are linearly varying (i.e., “finite rise times and fall times, as illustrated, for example, in FIG. 6A” at column 16, line 14):

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The leading and trailing edges both illuminate the object in a linear manner, with the leading edge rising in intensity and the trailing edge falling in intensity, and separated by a time period of approximately " T_{60} " as seen in figure 6A. Thus, the claim limitation is met by the leading and trailing edges of waveform 60 in figure 6A.

It appears as if the applicant assumed that the examiner was pointing to the waveform 62 in figure 6A as one of the two illumination lights. This is not the case. Waveform 62 does

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correspond to the reflected light as indicated by the applicant. However, this fact is irrelevant to the rejection. Again, the examiner is relying upon waveform 60 in figure 6A as comprising both illumination lights, one corresponding to the leading edge which linearly rises in intensity, and one corresponding to the trailing edge that linearly falls in intensity, where the trailing edge illuminates the object at a time later than the leading edge thus meeting the “sequentially” requirement. The rejection is maintained.

Allowable Subject Matter

4. Claims 14, 15, 18 and 19 are allowed. The prior art does not teach every element of the claims. For example, Ogawa does not teach sequential illumination with a first illumination light having a linearly varying intensity and a second illumination light which has a constant intensity. Yahav does not teach acquiring the image once during each illumination with a same pickup gain.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 571-272-7401. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner
Primary Examiner
Art Unit 2621
May 23, 2005



BRIAN WERNER
PRIMARY EXAMINER